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TECHNICAL NOTE

Modified Balloon Dissector in Subfascial Endoscopic Perforator Surgery

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Introduction

Subfascial endoscopic perforator surgery (SEPS) is an evolving treatment modality for incompetent venous perforators in the lower limb.[1] The key to successful identification and interruption of perforators in their subfascial location lies in the creation of a uniform and long tunnel in the leg. Commercially available balloon devices are commonly used for this purpose.[2] Although elegant in their utility, these tend to be single-use and consequently expensive. We report on the use of a balloon dissector used in SEPS made by modifying a Sengstaken-Blakemore tube (SBT).

Technique

SBT used for treating bleeding esophageal varices comprises of a distal gastric (spherical) and a proximal esophageal (sausage-shaped) balloon incorporated in a rubber tube. Both the balloons are connected to independent channels that allow their inflation. A third channel running upto the tip of the tube is used for aspirating gastric contents.

We found the esophageal balloon of a SBT to be optimally shaped for creating a subfascial tunnel and hence decided to put it to use for the purpose. We modified the SBT in three ways: (A) The gastric balloon is cut off (Fig. 1), (B) A small amount of cyanoacrylate glue is injected through the distal end to seal the channel opening into the esophageal balloon. This prevents leakage of air from the channel during inflation of the esophageal balloon, and (C) A 2-mm diameter metallic rod with an olive tip is retrogradely introduced in the aspiration channel (Fig. 2) to stiffen the SBT for easy introduction under the fascia. The assembly is sterilized with ethylene dioxide gas.

At surgery, a 10-mm incision is made through the skin and subcutaneous tissue behind the posterior border of tibia about 5 cm below the knee joint. The fascia overlying the posterior superficial compartment is incised transversely and the inferior lip of the incision grasped with a Kocher's forceps. The dissector previously prepared by aspirating all the air from

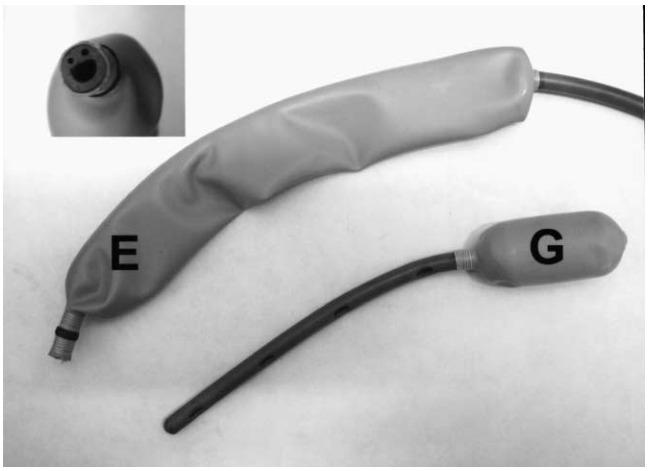

Fig. 1. Sengstaken-Blakmore tube with gastric balloon (G) cut off. Inset – distal ends of channels. E = esophageal balloon.

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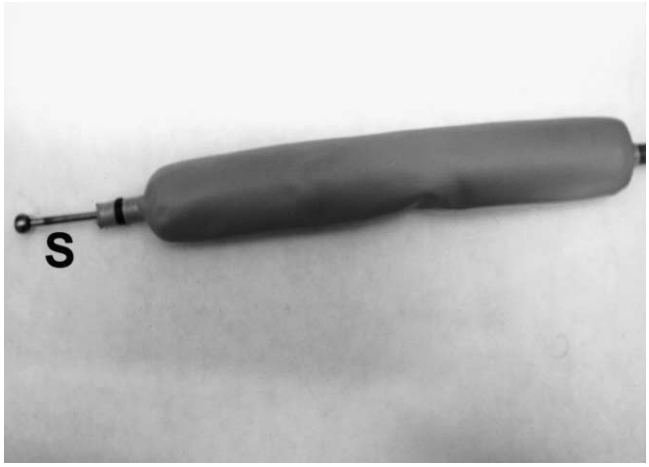

Fig. 2. Metal stiffener with olive tip (S) inserted into the aspiration channel with distended esophageal balloon.

the balloon (to reduce its volume) and lubricating the exterior with sterile K-Y jelly, is introduced under the fascia and advanced towards the medial malleolus. Once the entire balloon is under the fascia, it is inflated with air to around 250–300 ml. The balloon is left in place for 5 min, deflated and then withdrawn. A 10-mm metal laparoscopic cannula is introduced into the space and secured with a deeply placed mattress suture. The SEPS commences with insufflation of the space with CO_2 and introduction of the telescope connected to an endocamera through the cannula.

Discussion

We have successfully utilised this modified balloon dissector in over 40 limbs for performing SEPS and find that it creates a reproducibly adequate subfascial space each time. We keep the balloon inflated for 5 min to hold the space open as well as to act as a tamponade against oozing from small vessels disrupted during creation of the space. We found that the space thus created provides satisfactory access for clipping all lower paratibial, Cockett III and most Cockett II perforators.

In a country like India, the virtual non-existence of third-party reimbursement of health care costs makes the use of most disposable devices including commercially available, single-use SEPS balloons impractical and economically unviable – something probably true for several countries even outside the developing world. On the other hand, our balloon dissector is cheap and can be produced from a SBT that is readily available. It may or may not be reused depending on the user's choice. We reuse the balloon upto eight to ten times by thoroughly cleaning, soaking in 2% gluteraldehyde solution, rinsing, drying and resterilizing it with ETO after each use thus making it cost-effective; the average cost per case is less than $5.

Resterilization and reuse of medical equipment is a sensitive issue. However, several studies from Western countries have shown that provided adequate measures are taken for cleaning, disinfection and reterilization of devices such as coronary angioplasty catheters their reuse neither increases the risk of disease transmission nor alters the procedure outcome.[3–5] Our SBTs were reprocessed in the Central Supplies and Sterilization Unit of the hospital adhering to a standardized protocol and we did not observe any ill effects of ETO sterilization on the functionality of the balloon.

In conclusion, we present a simple and novel alternative to the commercially available balloon dissectors used in SEPS.

References

1 Gloviczki P, Bergan JJ, Rhodes JM, Canton LG, Harmsen S, Ilstrup DM. Mid-term results of endoscopic perforator vein interruption for chronic venous insufficiency: lessons learned from the North American subfascial endoscopic perforator surgery registry. The North American Study Group. *J Vasc Surg* 1999; **29**: 489–502.

2 Tawes RL, Wetter LA, Hermann GD, Fogarty TJ. Endoscopic technique for subfascial perforating vein interruption. *J Endovasc Surg* 1996; **3**: 414–420.

3 Frank U, Herz L, Daschner FD. Infection risk of cardiac catheterization and arterial angiography with single and multiple use disposable catheters. *Clin Cardiol* 1988; **11**: 785–787.

4 Browne KF, Maldonado R, Telatnik M, Vlietstra RE, Brenner AS. Initial experience with reuse of coronary angioplasty catheters in the United States. *J Am Coll Cardiol* 1997; **30**: 1735–1740.

5 Shaw JP, Eisenberg MJ, Azoulay A, Nguyen N. Reuse of catheters for percutaneous transluminal coronary angioplasty: effects on procedure time and clinical outcomes. *Catheter Cardiovasc Interv* 1999; **48**: 54–60.

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